

Scenario detailed description

Part 1: Product Setup and billing

- Car manufacturer buys from the CSP
 - a connectivity offer
 - a split billing offer
- CSP provides to car manufacturer all needed technical information to integrate CSP management API (web portal credentials, name of the API bundle corresponding to the subscribed offer),
 - **Note:** an "API bundle" is a set of API (such as Ordering API, billing API etc.) corresponding to the offer subscribed by the partner that it will use to interact with CSP
- The car manufacturer integrates the API with their own IT system and proceeds to their deployment
- The CSP registers the offer subscription in the billing system
- The car manufacturer retrieves the infotainment data connectivity offer from CSP catalog by using *catalog management API* (probably with some filtering criteria to access only the part of the catalog corresponding to his needs) and builds its own service catalog based on connectivity offers provided.
- At the end of billing period, CSP rates offers fees and produces an invoice including connectivity and split billing fees
 - Car manufacturer receives an invoice
 - By using *Billing API*, Car manufacturer can also receive bill items corresponding to its invoice for invoice control or consumption follow up purposes

The diagram below summarizes the sequence of actions

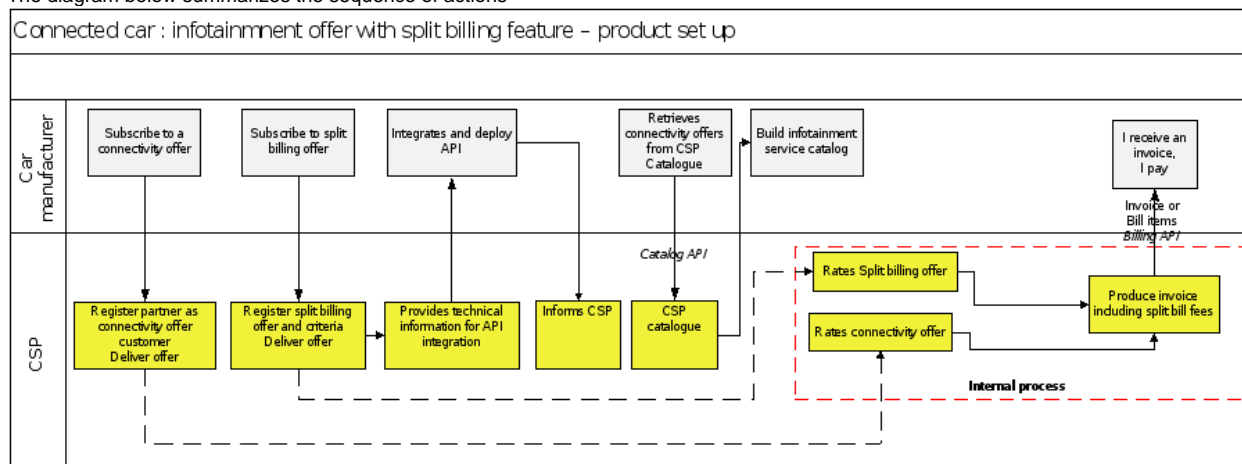


Figure 7 – Connected car product setup and billing
Part 2: Service Use

- When final customer (driver) buys a car, car manufacturer offers them an infotainment service associated with a connectivity service billed by CSP
- Driver selects an infotainment service and agrees to be 3rd party payer for connectivity service as connectivity is not included in infotainment service cost.
- Car manufacturer
 - Registers infotainment service order in its own system
 - Checks if driver is already a CSP customer by using *Customer management API* and, if so, retrieves customer billing information by using *Billing API*
 - Orders the infotainment data connectivity CSP offer
 - *Party API* allows car manufacturer to provide CSP with information allowing it to create 3rd payer
 - *Product ordering API* allows car manufacturer to place order for infotainment connectivity package
- CSP creates:
 - 3rd party payer,
 - Order for infotainment connectivity offer (for advanced offers, it will be possible to detail split billing criteria)
- CSP asks its mediation system to send usage related to the subscription
- Driver uses infotainment service, which generates data usages to bill on infotainment package
 - *Usage API* allows car manufacturer to retrieve usage for consumption follow up purposes
- CSP:
 - Splits infotainment usages from telematics usages
 - Rates infotainment usages for 3rd payer
 - Rates telematics usages for car manufacturer
- At the end of billing period, CSP:
 - Rates recurring fees for 3rd payer and car manufacturer
 - Produces invoices for car manufacturer and 3rd payer
- By using *Billing API*, car manufacturer can also receive bill items corresponding to its invoice

The diagram below summarizes the sequence of actions

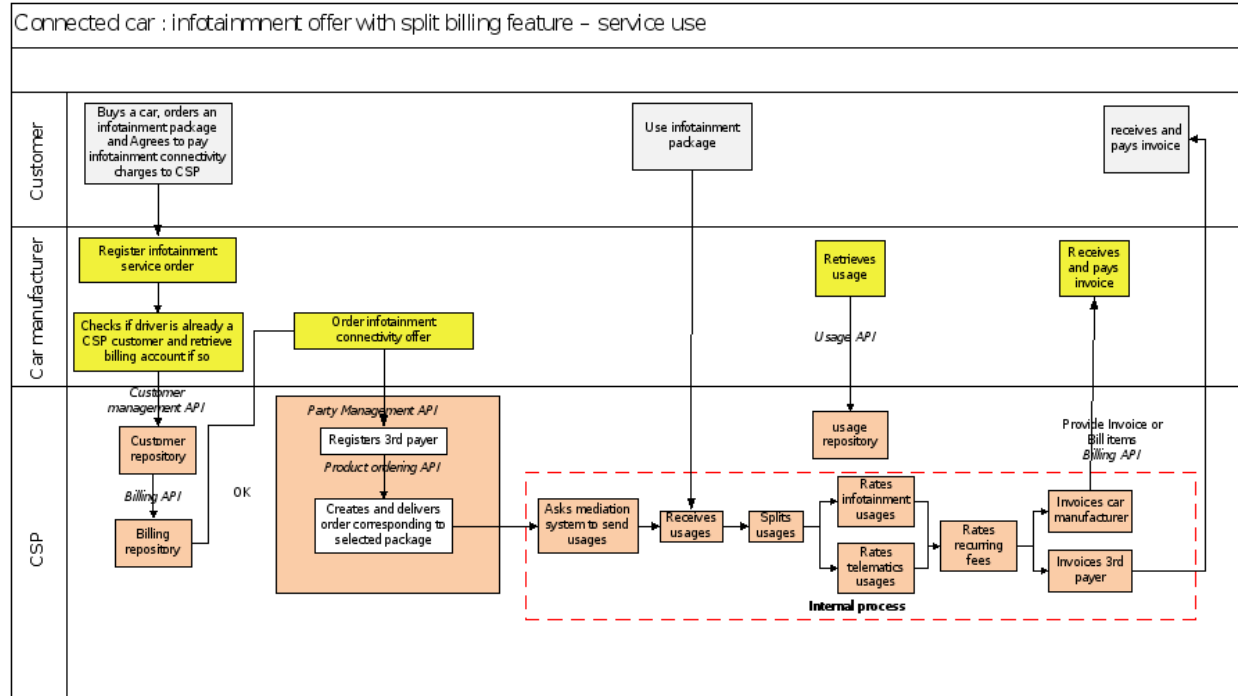


Figure 8 – Connected car service use

Part 3: trouble ticket management

Note: this part is based on the " Trouble ticketing management in ehealth domain" use case presented within the "ABC of multi-party digital services" catalyst adapted to automotive context.

- The call center manages all technical issues coordinating their resolution either by CSP or car manufacturer
- When receiving a support request from a driver, call center uses *Trouble Ticket API* to:
 - create a trouble ticket
 - send trouble ticket to CSP or car manufacturer according to nature of the trouble
- CSP or car manufacturer analyses the trouble and can redirect trouble ticket in case of misdirection by using *Trouble ticketing API*
- *Trouble ticketing API* allows also CSP / car manufacturer to update trouble ticket status /information depending on problem resolution progress and to notify updates to call center
- When problem is solved, CSP / car manufacturer uses *Trouble ticketing API* to send back Trouble Ticket to call center
- Call center informs customer and closes the trouble ticket
- CSP information concerning the trouble tickets is sent to car manufacturer which will use it to calculate the call center settlement note
- Car manufacturer sends settlement note advice to call center by using *Billing API*
 - Call center accepts or disputes the settlement notes
 - If call center agrees, CSP pays the settlement notes amount
- Car manufacturer may invoice CSP according to number of trouble tickets related to connectivity issues and send bill items corresponding to invoice by using *Billing API*

Call center can also play the role of SLA monitor / auditor:

- Call center can subscribe to SLA violation events notification by using *SLA management API*
- By using *SLA management API*, Call center can also :
 - Provide customer with SLA reports about SLA violation
 - Notify SLA violation creation to car manufacturer and CSP
- CSP and car manufacturer can retrieve SLA information by using *SLA management API*
- Call center can send alarms to teams in charge of problem resolution by using *Trouble Ticketing API*
- CSP and car manufacturer can notify SLA violation to the team in charge of problem resolution with related metric identifier by using *SLA management API*
- Teams in charge of problem resolution can correlate alarms with metric identifier
- End of SLA violation resolution process is, then, managed within trouble ticketing process

The diagram below summarizes the sequence of actions:

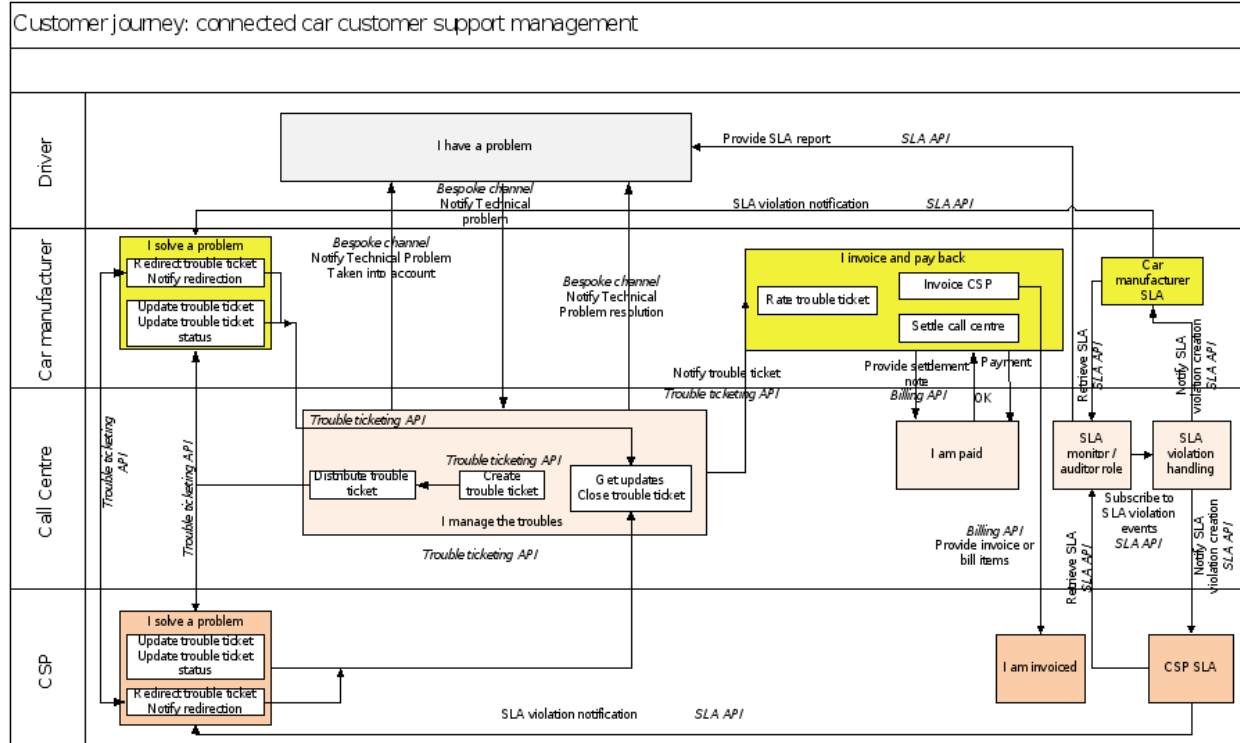


Figure 9 – Connected car trouble ticket and SLA management

Part 4: Creation and ordering of a new converged infotainment service

Note: this part is based on the "Digital service provisioning in a multi partner context" use case presented within the "ABC of multi-party digital services" catalyst adapted to automotive context.

- Creation of a new converged infotainment service
 - The CSP Catalog Manager defines CSP products which are available in central catalog managed by car manufacturer, for inclusion in 'converged' offers:
 - CSP Catalog Manager creates a product offering (for example 5 Gb data download for X euros)
 - CSP Catalog Manager marks the offer eligible for partners
 - By using *catalog management API*, CSP Catalog Manager sends the product to central catalog so that partners can choose the products to include in their 'converged' offers
 - The infotainment content provider (or content aggregator) defines a new converged offer:
 - Infotainment content provider creates a new offer (for example access to musical contents)
 - By using *catalog management API*, infotainment content provider retrieves CSP offers from central catalog
 - Infotainment content provider creates a new converged offer (for example 5 Gb music download for Y euros)
 - By using *catalog management API*, infotainment content provider can register its new converged offer in central catalog
 - By using *catalog management API*, CSP and car manufacturer can retrieve the infotainment converged offer and verify its correctness
 - By using *catalog management API*, the infotainment converged offer is sent to CSP, infotainment service provider and car manufacturer product catalogs so that customer can order it by using any of the three channels
- Ordering / delivery of the infotainment service
 - The customer (driver) places an order for a digital service via car manufacturer self-service portal and car manufacturer registers the order
 - *Customer management API* is used to retrieve customer and customer account
 - *Billing API* is used to retrieve billing account and create it if it doesn't exist
 - *Product inventory API* is used to retrieve existing products (if any) and check compatibility
 - *Product ordering API* is used to create infotainment converged offer order
 - Sometimes but generally later, customer requests service activation to infotainment service provider
 - By using *Product inventory API*, infotainment service provider checks if concerned service is owned (has been ordered) by the customer
 - If so, infotainment service provider uses *Product ordering API* to request specific connectivity service activation to CSP
 - By using *Product ordering API*, CSP notifies connectivity service order realization to infotainment service provider
 - infotainment service provider activates the service and use *product inventory API* to notify car manufacturer
 - At the end of the billing cycle, car manufacturer:
 - produces an invoice for customer
 - calculates settlements and uses *Billing API* to payback infotainment service provider and CSP

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sequenceDiagram
    participant CSP
    participant CM as Car manufacturer
    participant ICP as Infotainment content provider

    CSP->>CSP: Creates connectivity product offering
    CSP->>CSP: Makes offer as eligible for partners
    CSP->>CSP: Sends offer to central catalogue
    CSP->>CSP: Retrieves and verify offer
    CSP->>CSP: Updates CSP catalogue

    CM->>CM: Uploads offer in central catalogue
    CM->>CM: Retrieves and verify offer
    CM->>CM: Validates offer
    CM->>CM: Sends offer to local catalogues

    ICP->>ICP: Creates infotainment offer
    ICP->>ICP: Retrieves CSP connectivity offer from central catalogue
    ICP->>ICP: Creates infotainment converged offer
    ICP->>ICP: Updates infotainment content provider catalogue

    CSP->>CM: Catalog management API
    CM->>CSP: Catalog management API
    CM->>CSP: Catalog management API
    CM->>ICP: Catalog management API
    ICP->>CM: Catalog management API
    ICP->>CSP: Catalog management API
  
```

The diagram illustrates the process of creating a new infotainment converged offer across three lanes: CSP, Car manufacturer, and Infotainment content provider.

- CSP Lane:**
 - Creates connectivity product offering
 - Makes offer as eligible for partners
 - Sends offer to central catalogue
 - Retrieves and verify offer
 - Updates CSP catalogue
- Car manufacturer Lane:**
 - Uploads offer in central catalogue
 - Retrieves and verify offer
 - Validates offer
 - Sends offer to local catalogues
- Infotainment content provider Lane:**
 - Creates infotainment offer
 - Retrieves CSP connectivity offer from central catalogue
 - Creates infotainment converged offer
 - Updates infotainment content provider catalogue

APIs used for communication:

- CSP to Car manufacturer: Catalog management API
- Car manufacturer to CSP: Catalog management API
- Car manufacturer to Infotainment content provider: Catalog management API
- Infotainment content provider to Car manufacturer: Catalog management API
- Infotainment content provider to CSP: Catalog management API

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graph TD
    subgraph Customer
        C1[Subscribe to an infotainment converged offer]
        C2[Request service activation]
        C3[Use infotainment converged offer]
        C4[receives and pays invoice]
    end

    subgraph Car_manufacturer [Car manufacturer]
        CM1[Customer Management API  
Retrieves customer and customer account  
Billing API  
Retrieves billing account  
Product inventory API  
Retrieves products  
Product ordering API  
Creates order]
        CM2[Consult product inventory]
        CM3[Update product inventory]
        CM4[Internal process:  
Rates fees  
Invoices driver  
Calculate settlements]
    end

    subgraph Infotainment_content_provider [Infotainment content provider]
        IC1[Check if product is owned]
        IC2[Request connectivity service activation]
        IC3[Product inventory API  
Notify service activation]
        IC4[Activate infotainment service]
        IC5[I am paid]
    end

    subgraph CSP [CSP]
        CSP1[Activate connectivity service]
        CSP2[I am paid]
    end

    C1 --> CM1
    C2 --> IC1
    C2 --> CM2
    IC1 -- OK --> IC2
    IC2 -- Product ordering API --> CSP1
    CSP1 -- OK --> IC4
    IC3 -- Product inventory API --> CM3
    C3 --> CM4
    CM4 --> CM3
    CM4 --> CM2
    CM4 --> IC5
    CM4 --> CSP2
    IC5 -- Billing API, Provide settlement note --> IC4
    CSP2 -- Billing API, Provide settlement note --> IC4
    IC4 -- Payment --> C4
    CSP2 -- Payment --> C4
  
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Page 4